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Prioritizing Acute Coronary Syndromes with the Manchester Triage System

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DISSERTAÇÃO DE MESTRADO INTEGRADO EM MEDICINA

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Abstract

Introduction: Acute Coronary Syndromes (ACS) are a significant cause of death and morbidity and also a common presentation in the emergency department. Early myocardial revascularization provides strong benefits but timely treatment requires these patients to receive an adequate priority during triage in the emergency department.

Objectives: Determine if the Manchester Triage System (MTS) allowed ACS patients to receive an adequate priority, determine which were their presenting symptoms and characterize the etiology of chest pain in our population.

Methods: For a period of 3 months, we selected all patients who were admitted to our hospital with an ACS and who had not been transferred from other hospitals (84 patients). We analyzed their presenting symptoms and priority received during triage and determined if the priority would have changed with more recent MTS versions. The priority was considered adequate if it warranted medical observation within 10 minutes for ACS patients. During the same period, we also selected all patients (1459) who were triaged with the chest pain flowchart of MTS and who confirmed having chest pain during the medical interview and assigned each of them to a group of conditions, according to their final diagnosis.

Results: 77.4% of the ACS patients received an adequate priority and almost all underprioritized patients were so due to the pain intensity being considered as moderate. The changes in newer MTS versions do not improve this result significantly but considering a history of ischemic heart disease, which is not currently contemplated in MTS, as a *very urgent* discriminator would have resulted in a 26% decrease in the number of inadequate prioritizations. Regarding the etiology of chest pain, non-specific chest pain was the most common cause (26%), followed by respiratory conditions (14.1%); ischemic heart disease accounted for 7.9% of the cases.

Conclusions: Further improvement upon current triage systems is needed in order to provide timely treatment to ACS patients. This could be achieved by changes in the quantitative grading of pain during triage or by taking into account the presence of a previous history of ischemic cardiac disease. Most cases of chest pain fall into non-specific chest pain, respiratory conditions or psychiatric disorders, while ischemic heart disease is the 5th most frequent cause.

Keywords

Triage, Acute Coronary Syndrome, Ischemic Heart Disease, Chest Pain, Dyspnea, Pain Measurement

Introduction

It is estimated that, every year, about 780,000 people have an Acute Coronary Syndrome (ACS) in the United States (Amsterdam et al., 2014). While the incidence of ST-segment elevation acute myocardial infarction (STEMI) seems to have decreased, non-ST-segment acute myocardial infarction (NSTEMI) incidence increased and both STEMI and NSTEMI patients have fairly high in-hospital and long-term mortality rates (McManus, 2011). Thus, and despite the recent medical advances in this field, ACSs remain a major healthcare issue. In fact, almost 7000 deaths due to ischemic heart conditions were recorded in Portugal in 2013 (Instituto Nacional de Estatística, 2015).

It is recommended that all patients presenting with chest discomfort should have an EKG performed less than 10 minutes after arrival in the emergency department (ED), to allow for early diagnosis and timely intervention (Amsterdam et al., 2014; Roffi et al., 2015). Regarding possible interventions, early myocardial revascularization is now recommended by the main cardiology scientific societies (Windecker et al., 2014; O’Gara et al., 2013). This has already been shown to be a major factor for improving the outcome of patients with Myocardial Infarction (MI), especially in STEMI, for which a door-to-balloon time under 60 minutes should be sought (Windecker et al., 2014, O’Gara et al., 2013).

Hence, an early identification of ACS in the ED is mandatory in order to provide the early care required to improve the outcome of patients with MI. One way to ensure these patients receive the level of care they need in a timely manner is to prioritize the patients presenting in an ED using a triage system. Several have been developed all over the world and one such example is the Manchester Triage System (MTS), widely used in Europe (Mackway-Jones, Marsden, & Windle, 2013) and, particularly, in all public hospitals in Portugal. MTS currently has 55 flowcharts for major presentations and then each of these flowcharts has a number of discriminators, the presence of which in the patient is evaluated by the triaging nurse (Mackway-Jones et al., 2013). This results in the assignment of patients into one of the following categories: *emergent* (should be seen by a doctor immediately), *very urgent* (within 10 minutes), *urgent* (within 1 hour), *standard* (within 2 hours) or *non-urgent* (within 4 hours) (Mackway-Jones et al., 2013). Most patients with ACS are triaged using the chest pain, dyspnea or unwell adult flowcharts.

However, identifying all ACS patients by assigning them a priority of *emergent* or *very urgent* may not be a straightforward task. An ACS most commonly presents with thoracic pain and/or dyspnea but up to 20% of the ACS patients who presented to a local hospital were found to report neither of these (Pinto, Lunet, & Azevedo, 2011). In this respect, it has already been shown that the first version of MTS does present some limitations at adequately prioritizing ACS patients without chest pain or dyspnea (Trigo et al., 2008;

Pinto et al., 2011). On the other hand, chest pain is a common presentation in the ED and several studies found that less than 15-20% of these patients will actually have a cardiac etiology for the chest pain (Klinkman, Stevens, & Gorenflo, 1994; Svavarsdóttir et al., 1996; Verdon et al., 2008; Bösner et al., 2009).

Therefore, the present study has two distinct, albeit related objectives: 1) determine if the first version of MTS allowed ACS patients to receive an adequate priority (and if any improvement took place with the second and third versions of MTS) and which were their presenting symptoms, especially in those who did not report any chest pain or dyspnea; 2) characterize the etiology of chest pain in our population.

Methods

This study was conducted during a period of three months (March to May 2015) in the ED and Cardiology Department of Hospital de Santo António, a major tertiary hospital located in Porto and serving part of the population in Northern Portugal. Patients who had an ACS were considered to have received an adequate priority if they were triaged as *emergent* or *very urgent* and inadequate if they were triaged with *urgent*, *standard* or *non-urgent* priority. It should be noted that the concept of adequate or inadequate priority concerns the timely management of the patient required by the diagnosis of an ACS and does not evaluate whether the triage process was properly conducted or not.

This study was approved by the Ethics Commission of Centro Hospitalar do Porto.

ACS patients - Sample A

We selected all patients who presented to this ED and who were admitted to the cardiology ward or cardiology intensive care unit with a diagnosis of MI or unstable angina (UA), regardless of their presenting symptoms. These criteria yielded a total of 102 patients. As this work focuses on the triage system, we excluded 18 patients who had already been seen by a doctor either in other hospitals or in pre-hospital emergency services and then referred to our hospital after performing an EKG and with a suspected diagnosis of ACS, but who were nevertheless triaged. Those who were only seen by emergency technicians or nurses and did not have an EKG performed were kept in the study. Our final sample comprises 84 patients. The medical records pertaining to each of these episodes were reviewed in order to retrieve basic demographic data, the flowchart and discriminator used by the triaging nurse and the resulting priority, the type of ACS - STEMI vs. NSTEMI/UA - and whether the patient already had a history of ischemic cardiac disease. In all patients who were triaged with flowcharts other than chest pain or dyspnea,

or who received an inadequate priority, the presenting symptoms and signs were also collected. These signs and symptoms were further used to retriage the patients according to the second and third MTS versions, which introduced new discriminators in the abdominal pain and unwell adult flowcharts, along with some changes in the chest pain flowchart, which could potentially affect the priority given to ACS patients.

Chest pain patients - Sample B

Towards the second objective of this work, we selected all patients who presented to this ED within the same 3-month period and were triaged using the chest pain flowchart. This accounts for a total of 1463 patients. For each patient, we collected data regarding the discriminator chosen by the triage nurse and the resulting priority and also the final diagnosis, besides basic demographic information. According to the diagnosis, each patient was placed in one of 13 broad categories of medical conditions. When it was not obvious how the condition diagnosed could originate chest pain, the medical records pertaining to that episode were reviewed to ensure that there has not been any coding error in the diagnosis and that the patient effectively presented with chest pain. This was done for a total of 97 patients and only four of those were found to have denied chest pain during medical interview, in spite of having been triaged as having chest pain; these four patients were removed from the sample, resulting in 1459 participants in this arm of the study. There were no other exclusion criteria. This ED does not routinely receive children (<18 years).

Results

A quick overview of the study design and of the patients' distribution along each arm of this study can be found in Fig. 1.

Sample A (ACS patients)

The 84 patients in our sample had a median age of 65.0 ± 14.0 years, with a minimum and maximum age of 40 and 93 years, respectively. One third of our sample (28 patients) were females and two thirds (56 patients) were males. The female subgroup presented a median age of 72.0 ± 12.8 years and the male 63.0 ± 13.7 years. Most patients were triaged using the chest pain (71 patients, 84.5%) or dyspnea flowcharts (eight patients, 9.5%), while only five were triaged using other flowcharts (Fig.2).

Regarding the priority given to these patients, 77.4% received an adequate priority (63 patients were considered *very urgent* and two *emergent*) but there were still 19 patients

(22.6%) who only received an *urgent* priority. About 38% of the MIs were classified as STEMI (32 cases), and 84.4% of them received an adequate priority during triage; the percentage of NSTEMI patients receiving an adequate priority was somewhat lower: 73.1%. As for gender differences, and considering both STEMI and NSTEMIs, 35.7% of the female patients received an inadequate priority while this only happened to 16.0% of the male patients ($p=0.021$).

Overview of the study design and patient distribution in each arm of the study

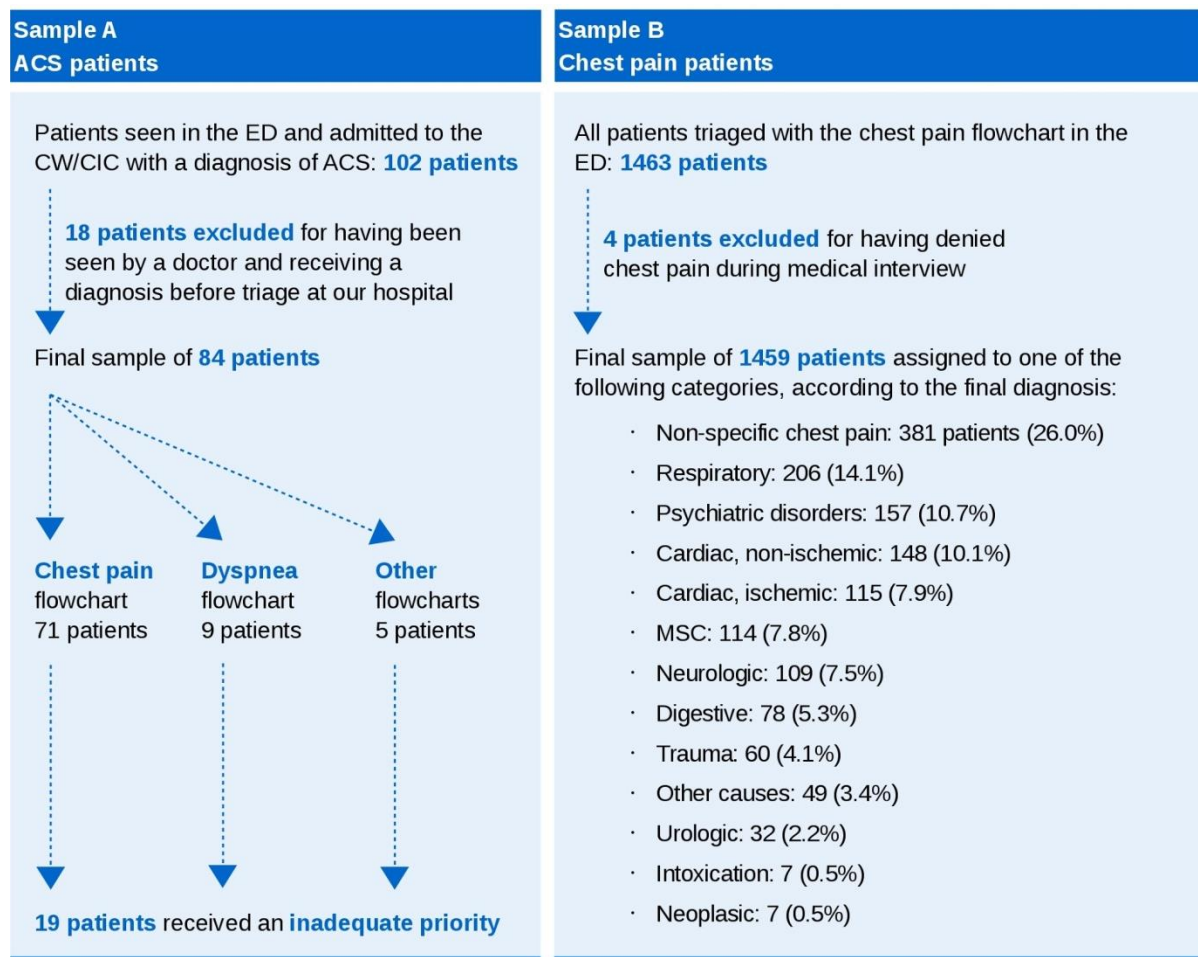


Figure 1: Overview of the study design and patient distribution in each arm of the study. ACS: acute coronary syndrome, ED: emergency department, MSC: musculoskeletal and cutaneous.

Flowchart used in the triage of ACS patients (Sample A)

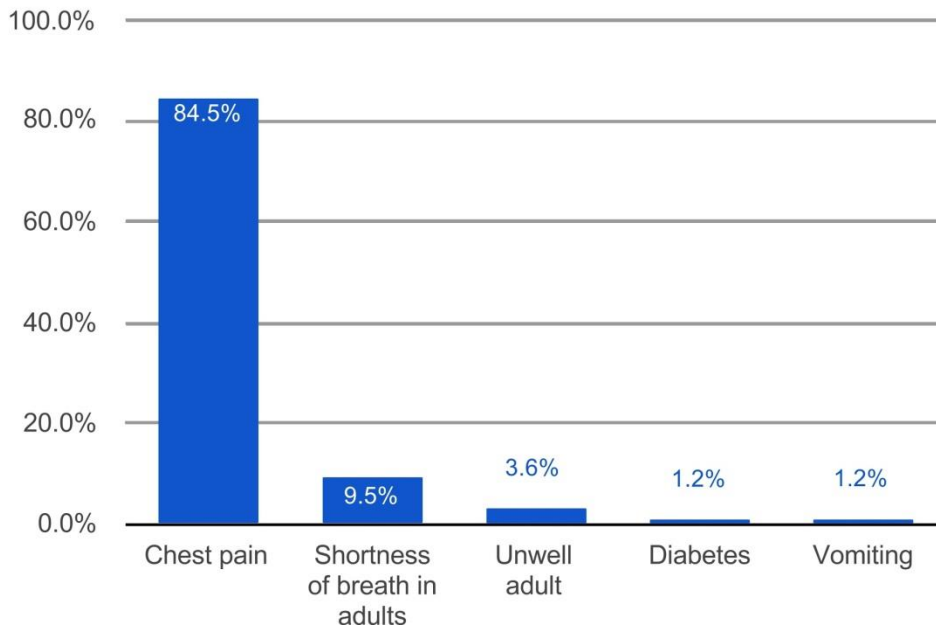


Figure 2: Flowchart used in the triage of the patients who were diagnosed with an ACS.

Analyzing the 19 patients who received an inadequate priority, we realize 17 of them presented chest pain (Fig. 3). The chest pain flowchart of MTS considers three distinct degrees of pain intensity - severe, moderate and mild pain - with each resulting in a different priority by itself, if no other discriminators are present. In our sample, the most common reason for a patient to receive an inadequate priority was being triaged with the chest pain flowchart of MTS and with the *moderate pain* discriminator, which results in an *urgent* priority; this was the case with 12 patients.

Focusing only on the five patients who were triaged using flowcharts other than chest pain or dyspnea, three of them presented chest pain (although they were triaged according to other flowcharts) two presented collapse/syncope, two had nausea/vomiting, while asthenia, hypertensive crisis and hypoglycemia were evidenced in one patient each. They all received an inadequate priority, except for the patient with hypoglycemia who was assigned an *emergent* priority.

We further looked for what happened to each of the patients receiving an inadequate priority and, specifically, if there was a delay in performing revascularization in STEMI patients, as these require a prompt revascularization (among the 37 STEMI patients in our sample, only five received an inadequate priority). Table I presents these results and shows that all these 5 STEMI patients had revascularization performed more than 60 minutes after arrival in the ED (with time intervals ranging from 91 to 212 minutes) while the median door-to-balloon time achieved in our hospital, since 2008, is around 80 minutes.

Signs and symptoms presented by ACS patients who received an inadequate priority

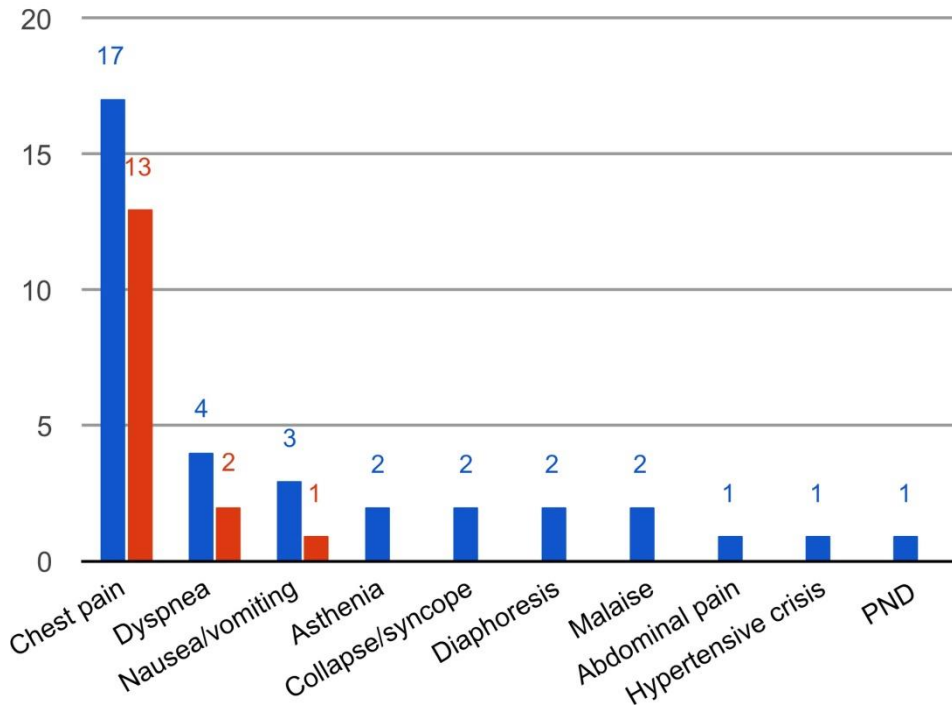


Figure 3: symptoms and signs presented by patients who were diagnosed with an ACS but received an inadequate priority (blue bars). As each patient can present more than one symptom, the sum of the number of times each symptom was reported (35) far surpasses the number of patients who received an inadequate priority (19). The orange superposed bars represent the flowchart used in the patients with inadequate priority; three other of these patients were triaged with the unwell adult flowchart and have not been represented here. PND: paroxysmal nocturnal dyspnea.

Table I: Triage details and timing of revascularization of the 19 ACS patients who received an inadequate priority during triage.

Flowchart used	Discriminator	Other possible flowcharts	Type of ACS	Revascularization strategy
Unwell adult	Rapid onset	Collapsed adult, vomiting	STEMI	PCI at 1h54m
Chest pain	Moderate pain	Vomiting	STEMI	PCI at 3h32m
Chest pain	Moderate pain	Dyspnea, abdominal pain in adults	STEMI	PCI at 1h57m
Chest pain	Moderate pain	None	STEMI	PCI at 2h41m
Chest pain	Moderate pain	None	STEMI	PCI at 1h31m
Vomiting	Moderate pain	Diabetes	NSTEMI/UA	PCI at 8h37m

Chest pain	Moderate pain	Dyspnea	NSTEMI/UA	Conservative treatment due to comorbidities and functional status
Chest pain	Moderate pain	None	NSTEMI/UA	PCI at 64h04m
Chest pain	Pleuritic pain	None	NSTEMI/UA	PCI at 93h52m
Chest pain	Moderate pain	Unwell adult	NSTEMI/UA	Conservative treatment due to comorbidities and functional status
Chest pain	Moderate pain	None	NSTEMI/UA	PCI at 25h02m
Chest pain	Moderate pain	None	NSTEMI/UA	PCI at 50h49m
Chest pain	Moderate pain	None	NSTEMI/UA	PCI at 12h15m
Unwell adult	Moderate pain	None	NSTEMI/UA	Left AMA before revascularization
Dyspnea	Pleuritic pain	Chest pain	NSTEMI/UA	PCI at 51h17m
Chest pain	Moderate pain	Dyspnea	NSTEMI/UA	PCI at 22h15m
Unwell adult	Rapid Onset	Chest pain, collapsed adult	NSTEMI/UA	PCI at 19h23m
Dyspnea	Pleuritic pain	None	NSTEMI/UA	PCI at 18h34m
Chest pain	Moderate pain	Unwell adult	NSTEMI/UA	PCI at 3h12m

The time intervals presented are not exact door-to-balloon times but rather represent the time elapsed since the patient arrived in the ED until the PCI procedure started. All five STEMI patients survived and did not have relevant limitations after completing a cardiac rehabilitation program. ACS: acute coronary syndrome, NSTEMI/UA: non-ST elevation myocardial infarction/unstable angina, STEMI: ST elevation myocardial infarction, PCI: percutaneous coronary intervention, AMA: against medical advice.

Finally, when we retriaged the patients using the second version of MTS (the latest which has already been validated for Portuguese language), three patients changed from an inadequate to an adequate priority. Using the third version of MTS (still unavailable in Portuguese language) a total of five patients changed to an adequate priority and, coincidentally, three of these patients also had a history of ischemic heart disease. However, two of the patients who had their priority upgraded did so because the pain described in the medical records was considered *cardiac* by the authors and another two did so because their peripheral oxygen saturation, by the time they were seen by a doctor, was low enough to meet the criteria of the “very low oxygen saturation” discriminator of chest pain and dyspnea flowcharts.

Sample B (Chest pain patients)

Regarding the etiology of chest pain, the 1459 patients were aged between 17 and 96 years, with a median of 56 years and a standard deviation of 18.7 years; 45.7% were female, 43.3% were male and the gender had not been recorded for 11.0% of the patients. Fig. 4 presents the causes of chest pain found in our sample; ischemic chest pain (including ACS and stable angina) accounted for just under 8% of chest pain complaints (115 patients). Figure 5 presents the distribution of these 115 patients; the additional patient identified in the chest pain arm of the study who was triaged with the chest pain flowchart and admitted to the cardiology ward/cardiac intensive unit but was not identified in the ACS arm resulted from a coding error of the final diagnosis at discharge. The priority received by all patients presenting with chest pain and also by those who were later found to have an ischemic cardiac condition is presented in Table II.

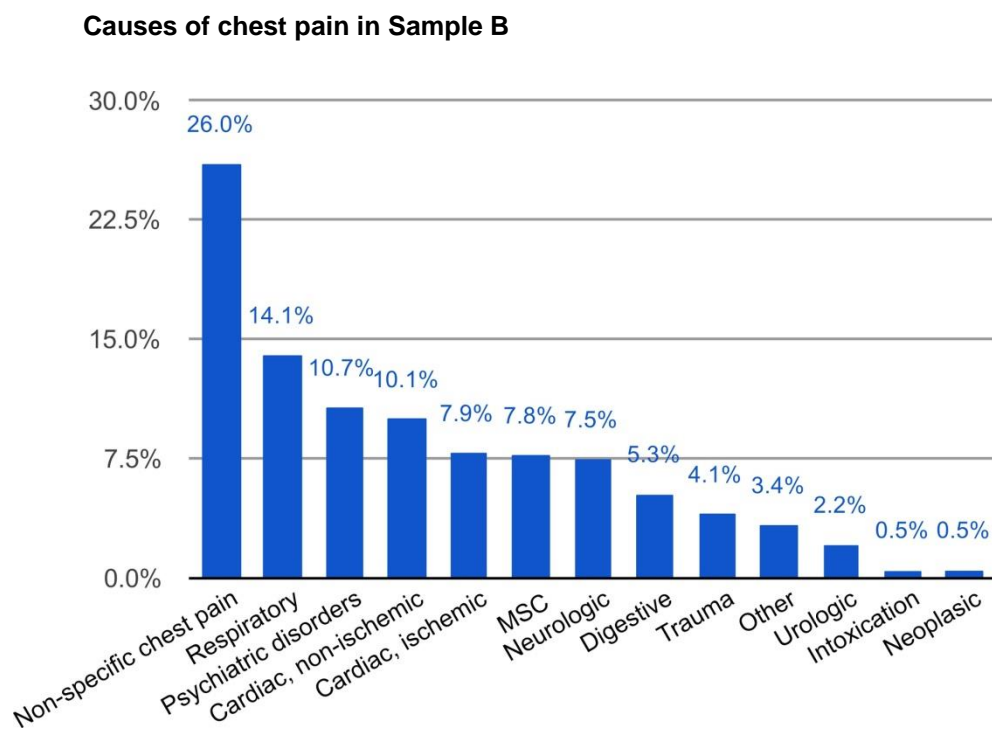


Figure 4: causes of chest pain in the patients triaged with the chest pain flowchart. MSC: musculoskeletal and cutaneous.

Cardiac, ischemic chest pain patients distribution

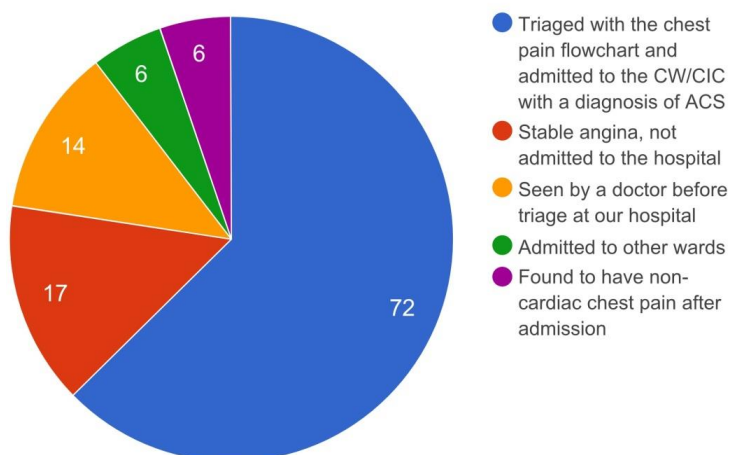


Figure 5: Distribution of the 115 patients triaged with the chest pain flowchart and diagnosed with a cardiac, ischemic condition. ACS: acute coronary syndrome; CW/CIC: cardiology ward/cardiac intensive unit.

Table II: Priority received by all patients triaged with the chest pain flowchart and by the subgroup that was diagnosed with an ischemic cardiac condition.

Priority	Chest pain patients (n=1459)	Priority	Cardiac ischemic disease (n=115)
Non-urgent (<4 h)	1 (0.07%)	Non-urgent (<4 h)	0 (0.00%)
Standard (<2 h)	25 (1.71%)	Standard (<2 h)	0 (0.00%)
Urgent (<1 h)	834 (57.16%)	Urgent (<1 h)	27 (23.48%)
Very urgent (<10 min)	595 (40.78%)	Very urgent (<10 min)	86 (74.78%)
Emergent (0 min)	4 (0.27%)	Emergent (0 min)	2 (1.74%)

Discussion

Analyzing the distribution of etiologies for chest pain reported in the ED, the leading diagnosis was found to be non-specific chest pain (26.0%), followed by respiratory (14.1%) and psychiatric conditions (10.7%). Ischemic cardiac conditions only come in fifth place, diagnosed in 7.9% of the patients, a percentage which is similar to previous results for another Portuguese hospital (Leite et al., 2015). Among the patients presenting in the ED with chest pain, 98% of them received a priority of *urgent* or *very urgent*.

Although most patients with ACS got an appropriate priority at triage, there were still 22.6% who were given a priority considered too low, given the need for a quick management in order to improve the outcome of these patients, especially in STEMI. While it is not reasonable to expect that some triage system will be able to identify all ACS patients without any false positives, this percentage is still high enough to prompt an improvement of current triage systems. A previous study in another Portuguese hospital found that only 13.7% of ACS patients had received an inadequate priority (Pinto et al., 2010). However, this study included patients who had already been seen and diagnosed at other hospitals and who were then transferred to that PCI-capable center and, therefore, is not directly comparable to our results as we only included patients who have had no previous medical observation. Two older similar studies performed in Portuguese hospitals found that the MTS had resulted in an inadequate priority in 21.0% (Trigo et al., 2008) and 37.8% (Matias et al., 2008) of their ACS patients.

Our results show that all ACS patients diagnosed with STEMI and who had received an inadequate priority (five patients in a total of 37 STEMIs) failed the goal established by European guidelines (Roffi et al., 2015) for myocardial revascularization in PCI-capable centers (<60 minutes). Furthermore, their door-to-balloon times were longer than the median observed in this hospital since 2008, which is about 80 minutes. Even so, in any of these particular cases the delay resulted in major events or complications to the patients. Testing for gender differences, we found out that female patients received an inadequate priority more often than men (35.7% vs 16.0%, $p=0.021$). Female patients with ACS may have atypical symptoms or lower intensity pain than men, or they may underreport the pain; all these possibilities may contribute for this finding (O'Keefe-McCarthy, 2008; Albarran, Clarke, & Crawford, 2007), together with the fact that the median age of the female patients in our sample is nine years higher than what was found in the male subgroup. Regardless of the cause for this difference, the fact is that a trend regarding gender differences has also been observed in other studies which showed a significantly worse outcome for women with STEMI, when compared with men (Khera et al., 2015; Ghauharali-Imami et al., 2015). Not receiving an adequate priority causes a delay in being seen by a doctor and, as a consequence, also in undergoing myocardial revascularization. This, in turn, could potentially be a relevant factor in explaining the worst outcome in women, although other factors have also been found (Canto et al., 2007).

The relatively high percentage of patients receiving inadequate priority only sees a small improvement with the second and third versions of MTS as the priorities given to the patients in our sample would remain largely the same. In fact, it may be argued that four out of the five patients who changed to an adequate priority did so by the larger amount of information that was available to the authors, when compared to the triage nurse.

However, the triage should be a quick process aimed at prioritizing each patient and not at obtaining a full history. Therefore, a true comparison of two triage systems - or two versions of the same system, as in this case - would require to have a nurse with appropriate training and experience for each of the systems triaging the patients in similar conditions. On the other hand, the percentage of ACS patients receiving an inadequate priority could be lowered by considering a previous history of ischemic cardiac disease in two MTS flowcharts. Indeed, we realized that if a history of ischemic cardiac disease was considered as a discriminator leading to *very urgent* priority in the chest pain and dyspnea flowcharts, the percentage of patients receiving an adequate priority would rise by an additional six percentage points, from 77.4 to 83.3%.

In our sample, the percentage of ACS patients who actually denied having chest pain during medical interview is just 2.4%. This percentage is lower than reported elsewhere (Pinto et al., 2011), being equivalent to only five patients. While it is not clear why this is such a rare presentation in our sample, it also precludes us to draw any firm conclusions regarding presentation symptoms and signs of ACS without chest pain.

A major source of underprioritization in our sample of ACS patients were those who presented with chest pain but whose pain was only considered to be moderate during triage. While some patients with an ACS, in fact, report little or no pain at all, considering the subjectivity of pain grading, a point of improvement in MTS could, perhaps, be the way pain is graded during triage. Indeed, it has been found that pain assessment during triage is done infrequently (van der Wulp et al., 2011), while another study showed that the inter-rater agreement in assessment of pain is relatively low and also different from the patient's perspective (Hangaard, Malling, & Mogensen, 2015). This way, the nurse's training in assessing pain intensity, specifically in the context of triage, may play an important role in trying to decrease the number of ACS patients who receive an inadequate priority, as was found in this study.

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Prioritizing Acute Coronary Syndromes with the Manchester Triage System

Resumo Circunstanciado em Português

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DISSERTAÇÃO DE MESTRADO INTEGRADO EM **MEDICINA**

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Resumo

Introdução: Os Síndromes Coronárias Agudas (SCA) são uma causa significativa de morbimortalidade e são também uma apresentação frequente no serviços de urgência. A revascularização miocárdica precoce tem fortes benefícios mas o tratamento atempado destes doentes implica que a triagem no serviço de urgência lhes atribua uma prioridade adequada.

Objetivos: Determinar se o Sistema de Triagem de Manchester (STM) permitiu aos doentes com SCA receber uma prioridade adequada, determinar quais foram os seus sintomas de apresentação e caracterizar a etiologia da dor torácica na nossa população.

Métodos: Durante um período de três meses, foram selecionados todos os doentes admitidos neste hospital com SCA e que não tinham sido transferidos de outros hospitais (84 doentes). Foram analisados os seus sintomas de apresentação e a prioridade recebida na triagem, bem como alguns fatores potencialmente relacionados com a prioridade recebida e foi ainda determinado se essa prioridade mudaria com versões mais recentes do STM. Durante o mesmo período, foram também selecionados todos os doentes (1459) triados com o fluxograma da dor torácica e que confirmaram ter dor torácica durante a anamnese médica e cada um deles foi alocado a um grupo de etiologias de acordo com o diagnóstico final que receberam. A prioridade foi considerada adequada se assegurasse observação médica num período de 10 minutos para doentes com SCA.

Resultados: 77.4% dos doentes com SCA receberam uma prioridade adequada e quase todos os que foram subpriorizados, foram-no por a intensidade da dor ser considerada moderada. As alterações nas novas versões do STM não alteram significativamente estes resultados mas a consideração de uma história prévia de doença cardíaca isquémica, que não é atualmente contemplada no STM, como um discriminador muito urgente resultaria numa diminuição de 26% no número de doente subpriorizados. Relativamente à etiologia da dor torácica, a causa mais comum foi a dor inespecífica (26%), seguida por patologia respiratória (14,1%); a doença cardíaca isquémica representou 7,9% dos casos.

Conclusões: São necessárias melhorias nos sistemas de triagem atuais para providenciar tratamento atempado aos doentes com SCA. Tal poderá ser conseguido introduzindo mudanças na determinação quantitativa da intensidade da dor ou valorizando a presença de uma história de doença cardíaca isquémica. A maior parte dos casos de dor torácica são inespecíficos ou causados por patologia respiratória ou psiquiátrica, sendo a doença cardíaca isquémica a 5ª causa mais frequente.

Introdução

Os Síndromes Coronárias Agudas (SCA) estão associados a uma mortalidade elevada, tanto no hospital como a longo prazo (McManus, 2011) e, de facto, foram a causa de quase 7000 mortes em Portugal em 2013 (Instituto Nacional de Estatística, 2015).

É recomendado que todos os doentes com dor torácica realizem um eletrocardiograma (ECG) nos primeiros 10 minutos após a chegada ao Serviço de Urgência (SU), para permitir um diagnóstico e intervenção atempadas (Amsterdam et al., 2014; Roffi et al., 2015). A revascularização precoce é recomendada pelas principais organizações científicas de cardiologia e já provou ser um fator crucial para melhorar o *outcome* dos doentes com enfarte agudo do miocárdio (EAM), especialmente quando existe supradesnivelamento do segmento ST (STEMI); nestes casos, o tempo porta-balão deverá ser inferior a 60 minutos (Windecker et al., 2014, O’Gara et al., 2013).

Desta forma, é essencial identificar precocemente os doentes com SCA no SU, o que pode ser realizado recorrendo a um sistema de triagem. O Sistema de Triagem de Manchester (STM), utilizado em todos os hospitais públicos portugueses, usa 55 fluxogramas para os principais sintomas de apresentação dos doentes no SU e cada um deles tem um conjunto de discriminadores cuja presença no doente é avaliada pelos enfermeiros que realizam a triagem (Mackway-Jones et al., 2013). O resultado é a atribuição a cada doente de uma das seguintes prioridades: *emergente* (deve ser visto pelo médico de imediato), *muito urgente* (dentro de 10 minutos), *urgente* (uma hora), *standard* (duas horas) e *não-urgente* (quatro horas) (Mackway-Jones et al., 2013).

No entanto, identificar todos os doentes com SCA (atribuindo-lhes uma prioridade de *emergente* ou *muito urgente*) não é trivial. Foi verificado que até 20% dos doentes com SCA não apresentavam dor torácica nem dispneia (Pinto, Lunet, & Azevedo, 2011) e a primeira versão do STM apresenta algumas limitações na priorização adequada desses doentes (Trigo et al., 2008; Pinto et al., 2011). Por outro lado, a dor torácica é um sintoma comum num SU e vários estudos mostraram que só em menos de 15-20% dos doentes é que dor torácica têm como origem uma patologia cardíaca (Klinkman, Stevens, & Gorenflo, 1994; Svavarsdóttir et al., 1996; Verdon et al., 2008; Bösner et al., 2009).

Assim, este estudo tem dois objetivos: 1) determinar se a primeira versão do STM permite aos doentes com SCA receber uma prioridade adequada (e se teria ocorrido alguma melhoria com as versões subsequentes do STM) e quais eram os sintomas de apresentação nos doentes sem dor torácica ou dispneia; 2) caracterizar a etiologia da dor torácica na nossa população.

Métodos

Este estudo focou-se no período de março a maio de 2015 e foi realizado no SU e no departamento de cardiologia do Hospital de Santo António. Foi considerado que os doentes com SCA receberam uma prioridade adequada quando foram triados como *emergentes* ou *muito urgentes*.

Amostra A – Doentes com SCA

Foram selecionados os doentes admitidos no serviço de cardiologia provenientes do SU com diagnósticos de EAM ou angina instável (AI), e que não tinham sido observados por nenhum médico antes de chegarem a este SU, resultando numa amostra de 84 doentes. Foram obtidos os dados demográficos, de triagem, tipo de SCA, existência de história prévia de doença cardíaca isquémica e os sinais e sintomas de apresentação. Estes foram usados para retrair os doentes de acordo com as novas versões do STM.

Amostra B – Doentes com dor torácica

Foram selecionados os doentes que foram triados nesse mesmo período, neste SU, usando o fluxograma da dor torácica. Foram excluídos quatro doentes que negaram dor torácica durante a entrevista médica, resultando numa amostra final de 1459 doentes. Foram colhidos os dados demográficos, de triagem e o diagnóstico final e, de acordo com este último, cada doente foi colocado numa de 13 categorias de etiologias de dor torácica.

Resultados

A Figura 1 apresenta uma visão geral do desenho deste estudo e da distribuição dos doentes em cada braço do estudo.

Amostra A (doentes com SCA)

A idade mediana da amostra é 65 anos, sendo um terço dos doentes (28) do sexo feminino.

A maioria dos doentes foi triada usando o fluxograma da dor torácica (71 doentes, 84,5%) ou dispneia (oito doentes, 9,5%) e em apenas cinco foram usados outros fluxogramas.

A prioridade recebida foi adequada em 77,4% dos doentes mas outros 19 doentes (22,6%) só receberam a prioridade de *urgente*. Verificou-se que 35,7% das mulheres receberam uma prioridade inadequada, contra apenas 16,0% dos homens ($p=0.021$).

A história de doença cardíaca isquêmica não é atualmente contemplada no STM mas, se este fosse um discriminador dos fluxogramas de dor torácica e dispneia que resultasse em prioridade *muito urgente*, o número de doentes subpriorizados desceria 26%, para 14. Entre os 19 doentes que foram subpriorizados, 17 apresentavam dor torácica. No entanto, em 12 destes doentes, a intensidade da dor foi classificada como moderada, o que resulta na prioridade *urgente* e esta foi a principal causa de subpriorização na nossa amostra.

Visão geral do desenho do estudo e da distribuição de doentes em cada braço do estudo

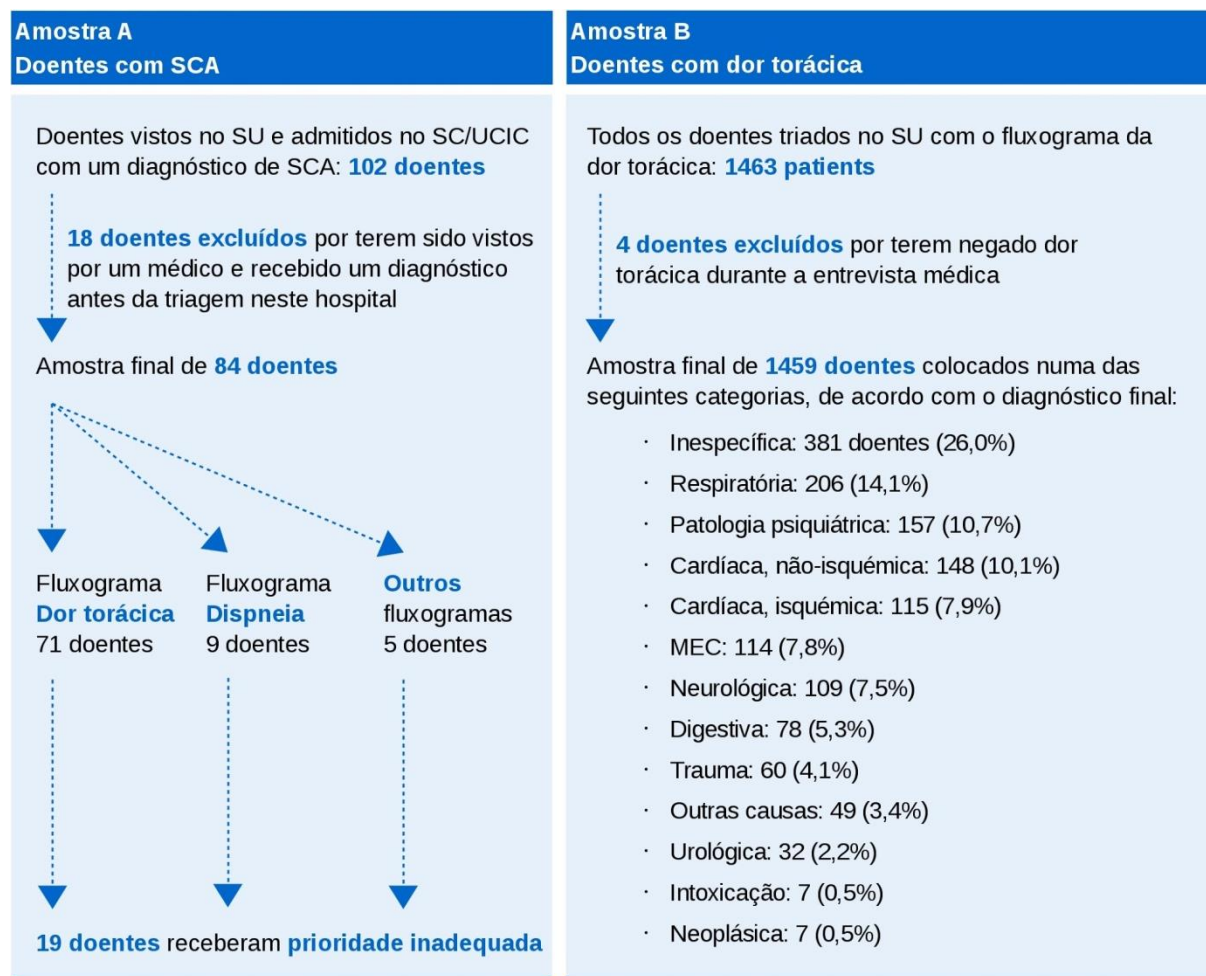


Fig. 1: Visão geral do desenho do estudo e distribuição de doentes em cada braço. SC/UCIC: Serviço de cardiologia/Unidade de cuidados intensivos coronários; MEC: musculoesquelética e cutânea.

Cinco dos doentes subpriorizados tiveram um STEMI e todos eles falharam o objetivo de 60 minutos para os tempos porta-balão, que se situaram entre 91 e 212 minutos para estes doentes. No entanto, todos sobreviveram e nenhum apresentava limitações relevantes após completar um programa de reabilitação cardíaca.

Retriando os doentes subpriorizados com a segunda e terceira versões do STM, verifica-se que três e cinco doentes, respetivamente, poderiam ter recebido uma prioridade adequada. No entanto, em 4 desses doentes, tal poderá dever-se ao facto de estar agora mais informação disponível do que aquela a que o enfermeiro tinha acesso durante a triagem.

Amostra B (doentes com dor torácica)

A idade mediana dos doentes nesta amostra foi 56 anos; 45.7% eram do sexo feminino, 43.3% masculino, e o sexo não foi registado em 11,0% dos doentes. As causas de dor torácica na nossa população encontram-se listadas na figura 1. Verifica-se que a dor torácica isquémica (que inclui SCA e angina estável) representa menos de 8% dos casos (115 doentes).

Discussão

A principal etiologia para a dor torácica foi inespecífica (26,0%), seguida por patologias respiratórias (14,1%) e psiquiátricas (10,7%). A doença cardíaca isquémica é a 5ª causa (7,9%), o que está de acordo com os resultados de um estudo realizado noutra hospital Português (Leite et al., 2015).

Apesar de a maior parte dos doentes com SCA terem recebido uma prioridade adequada, a percentagem que foi subpriorizada, 22,6%, é ainda muito alta tendo em conta a necessidade de revascularização urgente nos STEMI. Um estudo prévio noutra hospital Português concluiu que apenas 13,7% dos doentes com SCA tinham sido subpriorizados (Pinto et al., 2010). No entanto, esse estudo incluiu também doentes transferidos de outros hospitais, já com diagnóstico de SCA, pelo que os seus resultados não são diretamente comparáveis com os nossos. Outros dois estudos encontraram percentagens de subpriorização de SCA com o STM de 21,0% (Trigo et al., 2008) e 37,8% (Matias et al., 2008).

Todos os doentes com STEMI que foram subpriorizados (cinco doentes num total de 37 STEMI) falharam o objetivo definido pelas *guidelines* europeias de realizar intervenção coronária percutânea em menos de 60 minutos e os tempos porta-balão deles foram mais longos que a mediana observada neste hospital desde 2008, de cerca de 80 minutos. Apesar disso, nenhum desses cinco casos parece ter tido complicações de relevo em consequência destes atrasos. As doentes do sexo feminino foram subpriorizadas mais frequentemente que o sexo masculino (35.7% vs 16.0%, $p=0.021$). Tal poderá ser explicado pelo facto de a idade mediana das doentes do sexo feminino ser 9 anos

superior à do sexo masculino, sendo também possível que as mulheres tenham mais frequentemente do que os homens sintomas atípicos, dor de menor intensidade ou que reportem níveis de dor inferiores aos reais durante a triagem (O'Keefe-McCarthy, 2008; Albarran, Clarke, & Crawford, 2007). Alguns estudos mostraram que as mulheres com EAM têm *outcomes* piores que os homens (Khera et al., 2015; Ghauharali-Imami et al., 2015); sendo subpriorizadas, os tempos de revascularização miocárdica tornam-se mais longos, podendo este facto explicar parte das diferenças observadas nos *outcomes*, embora sejam também conhecidas outras explicações para tal (Canto et al., 2007).

Quando retriámos os doentes com as segunda e terceira versões do STM, a percentagem de doentes subpriorizados não melhorou consideravelmente, se considerarmos que em quase todos os doentes cuja prioridade melhorou, tal aconteceu porque temos agora mais informação do que aquela que estava disponível para os enfermeiros durante a triagem. Assim, uma comparação cuidadosa das várias versões do STM implicaria realizar a triagem na hora, em igualdade de condições com a triagem original. Por outro lado, a percentagem de doentes com SCA subpriorizados desceria seis pontos percentuais (de 22,6% para 16,7%) se a história de doença cardíaca isquémica for considerada como um discriminador *muito urgente* nos fluxogramas da dor torácica e dispneia.

Na nossa amostra, apenas 2,4% dos doentes com SCA negaram ter dor torácica durante a entrevista médica. Por razões não esclarecidas, esta percentagem é inferior à encontrada noutros estudos (Pinto et al., 2011) e, sendo equivalente a apenas 5 doentes, impede-nos de obter conclusões com significado estatístico sobre os sintomas de apresentação em SCA sem dor torácica.

A principal causa de subpriorização na nossa amostra de doentes com SCA são aqueles que apresentaram dor torácica mas em que esta foi considerada, durante a triagem, como tendo uma intensidade moderada. Embora alguns doentes com SCA efetivamente reportem dor de baixa intensidade ou até neguem ter dor, considerando a grande subjetividade na graduação da dor, um possível ponto de melhoria do STM poderia consistir na forma como esta é avaliada durante a triagem. De facto, já foi verificado que a avaliação da intensidade da dor durante a triagem não é frequente (van der Wulp et al., 2011), e outro estudo mostrou que a taxa de acordo entre diferentes observadores é relativamente baixa e, inclusivamente, diferente da perspetiva do doente (Hangaard, Malling, & Mogensen, 2015). Assim, a formação dos enfermeiros na avaliação da intensidade da dor, especificamente em contexto de triagem, pode desempenhar um papel crucial na tentativa de diminuir o número de doentes com SCA que são subpriorizados, tal como foi verificado neste estudo.